NATIONAL ENDOWMENT FOR THE HUMANITIES

SAMPLE APPLICATION NARRATIVE

Preservation and Access Grants
Institution: UCLA

UCLA Encyclopedia of Egyptology - Narrative

4.1 Significance

The civilization of Ancient Egypt is one of the most important and enduring in world history. Emerging from the prehistoric period (700 000 BCE), over its long history from predynastic times (5500 BCE) through the Pharaonic (3000 – 332 BCE) and Greco-Roman periods (332 BCE – 284 CE) to Late Antiquity (284 CE – 641 CE), ancient Egyptian civilization thrived over six millennia. The latest known examples of the Egyptian script – Demotic – were written as late as 452 CE, while Coptic, the last phase of the Egyptian language written in a script derived not from hieroglyphs but from the Greek alphabet, survives until today as a liturgical language. The material culture deriving from such a long period of time and such a prolific civilization in terms of written texts, art, architecture, and other material forms is enormous. The richness of this legacy enables us to reconstruct religious thinking, economic systems, intimate details of daily life, as well as ancient pathology, to name just a few aspects. The knowledge of Egyptologists, archaeologists, linguists, geologists, and all the other disciplines involved in research on Egypt, embodies the interdisciplinary approach that is needed to exploit such a wealth of evidence. Further, much of what has been discovered in excavations over the last two centuries is scattered throughout the world in museums, galleries, and university and private collections and is often difficult to access.

The UCLA Encyclopedia of Egyptology (UEE) proposes to work towards a virtual reunification of this heritage, including the knowledge that has been gained by studying the material in its archaeological and cultural context. This innovative approach opens the way to truly encyclopedic knowledge: a pathway to every relevant source of guaranteed quality, both with clear guidelines on how to search for the desired material, and with the potential to open unexplored research paths. Through offering a corpus of introductory, synthesizing, and interpretative articles that relate to primary and secondary sources on the UEE website or through other websites that develop high quality, sustained information, the UEE will provide an essential entry into ancient Egyptian Civilization.

The UEE will be of primary use for research and teaching of professional Egyptologists; historians of art, architecture, religion, science, and medicine; archaeologists; anthropologists; students of Egyptology and related disciplines; and for the numerous interested members of the general public who read at an academic level. Each entry has an opening screen with a brief factual description of its topic, in language that avoids jargon, giving quick access to the basic information. These brief descriptions will be published in English and Arabic. The latter is considered of great importance, because it will enable the Egyptian public to access an internationally established body of information on the Egyptian cultural heritage, while respecting present day Egyptian culture (see also section 4.2.2: future translation of the entire UE in Arabic). The following parts of the entry will be written for a scholarly, but not necessarily specialized, public. Technical language will, therefore, be avoided wherever possible.

Moreover, the UEE will serve as a template for scholars in other areas of the humanities who want to make their collections of primary materials, depictions, recordings, files, etc., available (see section 4.3 on methodology and standards). Communication and integration with comparable initiatives is considered of great importance and is already being pursued with the proposed Ancient World Online (AWOL, see section 4.2.3)

The UEE offers various types of entry. The core is formed by a quite traditional encyclopedic form of presentation, which has been selected deliberately, in order to ensure acceptance of the work by everyone working in Egyptology. The discipline has been characterized by a certain distrust of digital media, although younger Egyptologists generally recognize their potential. A key feature of the UEE is its innovative approach to data access by

means of hypermedia, that link information in ways otherwise not possible, enabling the user to combine data and interpretive articles in new ways.

The first implementation phase of the UEE, for which support is sought at NEH, concentrates on creating and publishing high quality scholarly content. Articles for the UEE are commissioned from specialized authors who are the authorities for each specific topic. The assignments are given with the specific request that the authors provide interdisciplinary insights in the topics (see section 4.3.1.4). This will facilitate the integration of knowledge, in a discipline that has traditionally been very specialized and compartmentalized. The online format makes it possible to combine the textual content with an abundance of relevant illustrations, maps and original research data. Thus the UEE will be a repository of excellent scholarly content. Authors drawing on their own fieldwork, such as archaeologists writing on sites or regions they have recorded, will be asked to provide illustrations to which they have the original copyrights and links to original digitized excavation records. Authors will also be given the option to store their original materials in the UEE digital repository, with the understanding that these will at some point be made accessible to a selective audience. Interactive maps will be created specifically for the UEE. For photographs of objects in museum collections, the UEE has initiated contacts with several museums (see the support letters of the Metropolitan Museum of Art; the University of Pennsylvania Museum of Anthropology, and Archaeology and the Petrie Museum of University College London). Furthermore, the UEE will provide links to current good quality and sustained Egyptological content on the Web. Annotated summaries of websites clarify their strengths and weaknesses, according to criteria provided by a panel of scholars. A first stage of this part of the project has been tested in several courses at UCLA during the 2004-2005 Academic year (see: http://www.humnet.ucla.edu/humnet/egyptology/uee/index.htm). An additional advantage of a digital over a printed encyclopedia is that publication of individual articles is much faster. Web-based repositories can also be updated regularly and solely for the entries that are in need of revision, rather than for a complete volume. Even the results of Implementation Phase I will create a major new resource for the profession, the public, and the humanities in general.

At this moment no similar comprehensive project, or resource on ancient Egypt exists (see section 4.2.4). The UEE will be the first reliable scholarly interactive Web resource for scholars and the lay public on ancient Egypt. This work will reach far beyond the narrowly defined group of professional Egyptologists; over 15,000 college students per year take classes on Egyptian history, art history, and civilization in the US alone. At UCLA over 650 students a year enroll in courses with specific Egyptological content. As outlined in section 4.6 the potential lay audience for the UEE is enormous, considering the success of exhibitions, lectures, and book sales on ancient Egypt. The UEE will not only fulfill an existing demand, but also create new audiences.

The first implementation phase concentrates on using the first large batch of (mainly textual) content to test the interaction of several open source search functionalities and the selected repositories. Commissioning, reviewing, and publication of the assigned articles is done through eScholarship (see section 4.3.2). This implementation is called the "UEE Open Version" and provides users with freely available PDF's of articles stored in and maintained by the California Digital Library (CDL). The full version of the UEE will have basic and advanced search options. The basic search options will also be freely available, but the advanced search options will have restricted access. Advanced search options will be freely available for Egyptian users, and for the students and faculty of UCLA and contributing institutions, as well as contributors and members. The advanced search functionalities will offer additional materials, such as interactive maps, pictures, 3D models, and access to original research data and primary sources. The repository for these items will be the UCLA Digital Library System (DL) (see section 4.3.4). Based on the results of the first implementation phase, the project will seek funds to complete, maintain and update the encyclopedia (see section 4.3.4.2 on financial sustainability).

A related, but separately funded project will seek to address the broader public by providing less specialized information for a general non-academic and K-12 level audience. This segment of the public has depended until now on Web materials that are often based on outdated or fanciful theories and have no direct link with the academic study of Egyptology.

4.2 History, Scope, and Duration

This proposal is an application for support of the first implementation phase and follows a pilot project (described below) that has been financed by UCLA.

4.2.1 History

The UEE developed out of the need in Egyptology for a current, comprehensive resource and as a counter to the many non-authoritative sources, especially ones that appear on the Web, that are used by students. The pilot is scheduled to be completed in March 2006. The results of this stage of the project are:

- establishment of the Academic Editorial Committee (complete)
- establishment of the Technology Committee (complete)
- acquiring endorsement of the International Association of Egyptologists (complete)
- online peer review system through eScholarship (complete) http://repositories.cdlib.org/nelc/uee/
- Entry Composition Codes matrix to direct the writing process (complete)
- conceptualization of the required UEE search functions (ongoing)
- development of content taxonomy (hierarchical system of facets and concepts from which the entries are developed, ongoing)
- proposal for the first 500 entries drawn from the content taxonomy (ongoing)
- Web Assessment Database (already functioning, to be expanded) http://www.humnet.ucla.edu/humnet/egyptology/uee/index.htm
- design of contracts for authors (complete);
- development of the metadata and coding system (ongoing);
- design of the screen layout (ongoing, for samples see the project description website) http://www.humnet.ucla.edu/UEE/screensamples.htm
- testing several open source applications (ongoing)

For the pilot phase, the UCLA Office of Instructional Development and the Department of Near Eastern Languages and Cultures (NELC) have provided the project with four Graduate Student Research positions for the 2004-2005 and the 2005-2006 academic years. The project team has developed the web assessment database and is involved in the development of schematic spatial models of several ancient buildings and work on the interactive map. Further, the Center of Digital Humanities at UCLA (CDH) and the UCLA Library are providing considerable staff support during this period to realize the goals listed above.

4.2.2 Scope and Duration

The pilot will be followed by three implementation phases. This proposal seeks support for the first implementation phase (see section 4.4 Plan of Work). A strategy is under development for raising continued funding for phases II and III.

Implementation Phase 1(2006–2008)
At the end of this phase the UEE Open Version will have published 500 encyclopedia text entries through eScholarship. The entries chosen will be the relatively short ones, between 500 and 1500

words to enable authors to submit a contribution on relatively short notice. Long synthesizing entries will be commissioned in the second and third phases. The UEE Open Version will consist of PDF's containing the entry title, a brief identification in English and Arabic, terminology in hieroglyphs and relevant illustrations. A trial of the UEE Full Version will be launched on the Web with the same 500 entries and the additional search and access functions that are described in this proposal. In addition to the entries accessible through eScholarship, entry titles can be searched in English, Arabic, French, and German. Each article will link to the relevant annotated references available through the website of the *Annual Egyptological Bibliography* (AEB, see section 4.2.4.2 below). Apart from text entries, a number of interactive exploratory entries will be incorporated, including a schematic model of the building phases of the Karnak temple complex and a landscape model of the Fayum region. The Karnak temple is a vast architectural complex that was built, added to, and remodeled over a period of 2000 years. The Fayum model will present human use of the landscape of the Fayum, an extremely important area for understanding the development of agriculture in Egyptian prehistory and a region developed extensively in the Greco-Roman period to provide Imperial Rome with grain. In addition this will include original files of recent excavations in the Fayum region. These two subjects will illustrate the range of possibilities for integrating textual, visual, numerical, and spatial information. An interactive map of Egypt will be another spatial approach to information access. Feedback from the public will be actively solicited, while scholars in Egyptology are given the possibility to comment on articles, to highlight a scholarly debate or alternative theories, and to submit suggestions for articles or updates.

Outline of Implementation Phase 2 (2008–2010)
At the end of this second phase an additional 1000 text entries will have been commissioned and incorporated into the structure of the UEE. Implementation Phase 2 will give specific attention to developing the image database of the UEE Full Version. Based on the results of Implementation Phase 1, the second phase will be used to broaden support for the project and integrate other initiatives. There will be increased activity in building financial sustainability. Collaboration will be set up with other projects, such as the online *Altägyptisches Wörterbuch*, the Griffith Institute, the METEOR and XSTAR initiatives, the Egyptian Center for Documentation of Cultural and Natural Heritage (CultNat), and the Library of Alexandria (see section 4.2.4.2).

Outline of Implementation Phase 3 (2010-2015)
At the end of this third phase the UEE will be published at its full scope and updating of the initial entries will have begun. A considerable number of authors will be asked to write larger synthetic articles, that link in with the entries published previously. Activities to build the financial base will be increased, as the full scale of the project is presented to potential donors. At UCLA we have access to resources through the Experiential Technology Center (ETC) that will give us the functionality to create high resolution research-based 3D reconstructions of temples, tombs, settlements, and landscapes. These models can be explored in real time and will be much more detailed than the models incorporated in the first two implementation phases. The research models incorporate published results, offer alternative interpretations, as well as interactive screens which highlight the specific reasons for each particular reconstruction. Due to the rapid development of the technology and the field of Digital Humanities the project may develop in avenues that cannot be foreseen at the moment. It will certainly be a goal of the UEE to keep abreast with useful methods to access and combine the digital objects in the repository.

Future desiderata
1. Publication of the UEE in Arabic for Egyptian readership.
It is desirable to develop and publish an Arabic UEE Full Version at the same time as the English one, but considering the costs involved in translating all text entries, the metadata and the search

functionality into Arabic, separate funding will be sought for this. In order to give the Egyptian public access to excellent information on its ancient heritage, the UEE Full Version will be freely available to IP addresses in Egypt. Egyptian scholars read and write English, but Egyptian students and the broader public often do not, or not at a level that is sufficient to make optimal use of the UEE. In addition original articles in Arabic could be commissioned from Egyptian colleagues and translated into English. A particularly important task would be to translate field reports originally published in Arabic, to enable access of information that would otherwise be difficult or impossible to obtain. Publishing an Arabic version of the UEE will appeal to the entire Arabic-speaking world, not just to the inhabitants of Egypt alone. This Arabic version will foster dialog, and positive exchange between American, European, and Egyptian scholars and public. In the first implementation phase, only the fact file (brief description) of the entries will be published in Arabic (in both the open and full version).

2. Integration of primary and secondary sources

It can be surmised that the future development of Digital Humanities is related to a change in emphasis in scholarship: from physical searches for information that is difficult to access (e.g. archives), to developing methods to analyze and synthesize large bodies of more easily accessible information (on the Web). Here cooperation with initiatives such as *Perseus* and *Etana* (see section 4.2.4.3) will be of great importance. Providing access to archival material from archaeological expeditions, or museum collections will be one of the future goals of the UEE. The development of data mining capabilities of the UEE will enhance access to a large body of content.

3. Publication of articles in French and German

The three official languages of the International Association of Egyptologists are English, French and German. Ideally authors should be able to submit their articles in any of these languages and Arabic. At this moment the budget does not allow for translation of the articles into English, the default language, but in future the English translation, as well as the article in the original language should both be published in the UEE Full Version.

4. Search functions on hieroglyphs.

At present searches on individual hieroglyphs and hieroglyphic texts are problematic. The most widely used programs to generate hieroglyphic texts are *Glyph* and *VisualGlyph*, programs that generate non-searchable bitmaps. The codes underlying the signs in the *Glyph* program can perhaps be used to create searchable fonts or transliterations. These codes have been published in the "Manuel de Codage" (MdC), a paper presented at the round table *Informatique et Egyptologie 2*, in Paris, 1988 (Buurman et al. 1988). An initiative to develop Unicode for hieroglyphs presents a promising alternative http://std.dkuug.dk/JTC1/SC2/WG2/docs/n1944.pdf). Because hieroglyphic writing is very variable, one approach is to the transliterations, rather than the hieroglyphic signs. Perhaps the most promising development is the launch of the Middle Egyptian Text Editions for Online Research (METEOR) project (http://www.oi.uchicago.edu/OI/PROJ/MET/Meteor.html). The experience of the developers of METEOR may enable the UEE to incorporate this search function much earlier than presently foreseen. A search function on hieroglyphs would enable access through UEE of actual primary sources in hieroglyphs.

5. Access for K-12 and lay public.

The information and structure of the UEE can be used to formulate attractively presented entries and give good quality information to children and young adults. This requires the involvement of specialized writers, artists, and editors to modify and adapt the content. The material is eminently suitable for developing interactive educational games, linked to the present 6th grade program, or

to specific exhibits in museums. Funding will be sought from a variety of federal and private sponsors.

6. Increased interactivity
From the outset the UEE offers a platform for scholarly debate in Egyptology by offering the opportunity to comment on articles and propose unsolicited articles or updates. Although the UEE is not an Egyptological message board or chat room, interactivity of the discipline and the public is also considered important. Interactive features will be incorporated in both the scholarly and K-12 / non-academic part of the website, such as exploratory models of temples, archaeological sites, and museum objects, as well as other means such as a "question of the month", and a regular update on new discoveries.

4.2.3 Projected Size of the UEE

Freed from the limitations of a printed encyclopedia, in which all entries starting with '*A'* have to be finished before the next letter can be printed, the digital encyclopedia does not have to be prepared in strict alphabetic order. The selection of entries in each phase is, therefore, geared to providing a well balanced coverage of the discipline, a coverage that will increase in both depth and detail.

At the start of the Implementation Phase 1 the Academic Editorial Committee will have submitted, reviewed and published several articles through eScholarship and will select 500 entries to be commissioned in the summer of 2006. This number is based upon a comparison with printed volumes, such as the *Oxford Encyclopedia of Ancient Egypt* and the *British Museum Dictionary of Ancient Egypt* (see below 4.2.4). These first 500 entries will treat the most important concepts from the various disciplines in the field and give a balanced view of ancient Egypt. The resulting website will be immediately of great use for a large audience and will provide a sound core for expansion. The average length of the articles will be 1500 words. Most authors can fit an article of relatively modest length into their schedule, while they cannot commit to writing a longer article. Large, synthesizing contributions, that may require double or triple that size, will mostly be commissioned in later phases of the project. This strategy will enable authors of overarching contributions to reference published articles and keeps the early stage of the project manageable.

The final size of the Encyclopedia of Egyptology is currently determined at 4000 text entries, of varying length, while retaining an overall average of 1500 words, giving a total number of 6,000,000 words. This size is based on a comparison with the *Lexikon der Ägyptologie (LÄ)*, hitherto the standard reference work for Egyptology. An overview of existing reference works on Egyptology in print is given in section 4.2.4 for comparison with the UEE. Here the scope of the *LÄ* is brought to the fore, because of its importance. The *LÄ* consists of seven volumes, of which the last one contains essentially the indexes. The other six volumes, which contain the text entries, comprise approximately 3000 entries and 4,200,000 words. An analysis of the admirable *Lexikon der Ägyptologie* shows that the editors' implicit definition of 'Egyptology' barely covered the Greco-Roman period, while the archaeology of Egypt, art history, the history of study, methodology, theory, and the legacy of ancient Egypt in the modern world are represented by relatively few entries. The editors of the UEE consider these areas to be of great importance and must therefore allow for numerous additional entries, as well as many considerably longer entries, to achieve a comprehensive level of coverage. Discussions with the editors of the Ancient World Online project (AWOL) have resulted in a definition of complementary focuses. AWOL is to cover the Late Antique period (284-641 CE) fully, while the Greco-Roman period (332 BCE to 284 CE) will be covered by both, but from different angles. The UEE will emphasize the origin of Greco-Roman phenomena, while the AWOL will concentrate on their legacy.

The UEE Open Version will consist of 4000 articles, published as PDF's through eScholarship, while the UEE Full Version will contain the 4000 matching textual entries, as well

as a large number of other objects, such as spatial models, maps, reconstructions, and illustrations which have their own metadata, and will be treated as separate, but fully integrated entries.

4.2.4 Comparison with existing resources

4.2.4.1 Printed Reference Works on Ancient Egypt

The *Lexikon der Ägyptologie* (*LÄ*, edited by Wolfgang Helck, Eberhard Otto, and Wolfhart Westendorf), is a seven-volume reference work published between 1972 and 1987. It has been the standard reference work in Egyptology for the past 20 years and continues to be extremely useful for professionals. Yet if we consider the target of the UEE, to address both scholarly and popular interest in America and beyond, we must conclude that the *LÄ* poses various problems. Most of the texts and all entry titles are in German, even though some articles are in English or French (and there are English and French indexes to the article titles). The entries are geared solely to a scholarly audience. There are very few illustrations. The series is very expensive and purchased almost exclusively by larger libraries. Students and the general audience do not have easy access to the *LÄ*. The conceptual structure of the *Lexikon* is not explicit and the entries vary widely in character and contents. Furthermore, twenty years after its appearance, the *LÄ* is partly outdated and the development of scholarly discourse makes revision of the range and configuration of entries urgent.

The *British Museum Dictionary of Ancient Egypt* (1995) was published to provide a compact reference work on Egyptology in English. The dictionary, written by Ian Shaw and Paul Nicholson, offers approximately 700 concise but very informative and well illustrated entries, encompassing approximately 350,000 words, with an average entry size of only 500 words. The bibliography is very limited. The scope and size make this a very useful introductory reference work, but as a source for even undergraduate research, it cannot compete with the *LÄ*.

Civilizations of the Ancient Near East, edited by Jack M. Sasson and others (1995), consists of four volumes that contain much information on ancient Egypt. The work includes 189 lengthy articles organized in eleven parts. The model is different from that of the BM dictionary, concentrating on providing high quality information on ancient Near Eastern cultures in long essays, rather than short factual introductions. The UEE is situated in between these two approaches, with a combination of long and short entries.

In 1999 Routledge published the *Encyclopedia of the Archaeology of Ancient Egypt*, edited by Kathryn Bard. This is a one-volume publication encompassing 14 essays on historical periods, and 350 entries, totaling approximately 240,000 words. This work provides an important complement to the *LÄ*, as it focuses specifically on archaeology. The coverage of archaeological sites slightly favors those excavated by authors from an English language background. The authors are respected and well-published colleagues who have provided us with an important, but not comprehensive resource.

The most recent publication in this genre is the three-volume *Oxford Encyclopedia of Ancient Egypt* (2001), edited by Donald Redford. It has about 600 entries, totaling approximately 1,000,000 words. The *Oxford Encyclopedia* has a clear structure and a modern conceptualization of entries, including such titles as *gender*. All articles are in English and thus accessible to American undergraduate students. Written by a large number of authors, the quality of the contributions varies considerably (see Baines 2001). In general the entries are accessibly written. The target audience differs from that of the *LÄ*, the Oxford Encyclopedia is perhaps best characterized as semi-popular.

4.2.4.2 Ancient Egypt on the Web

Many websites provide information on ancient Egypt. Large numbers are hosted by non-professional enthusiasts. The quality of the content of these sites varies widely; one task of the UEE will be to assess them in order to discern whether a cooperative effort, or simply providing a link, is appropriate. An additional problem is that many non-professional, and even some professional websites are volatile and do not archive earlier versions. Numerous high quality websites are available. Several of these are listed below (in alphabetical order), with comments on how they complement the UEE and on ways in which a cooperative effort would be beneficial.

Altägyptisches Wörterbuch

The *Altägyptisches Wörterbuch,* directed by Stephan Seidlmayer, provides an online version of another Egyptological standard work, the *Wörterbuch der Ägyptischen Sprache*, edited by Adolf Erman and Hermann Grapow (1926-1963). Since then the underlying material (the number of available ancient Egyptian texts) has doubled, while new linguistic and philological methods have been developed, requiring a different lexicographical approach. The website integrates a lexical database with a text corpus and virtual dictionary. The *Altägyptisches Wörterbuch* works with image-based hieroglyphic texts; these only enable searches on metadata.
http://www.bbaw.de/forschung/altaegyptwb/

Annual Egyptological Bibliography

A unique resource is the *Annual Egyptological Bibliography* (AEB), an initiative of the International Association of Egyptologists, published by the Netherlands Institute of the Near East at Leiden. The present editor is Willem Hovestreydt. Since 1947 the AEB has appeared in book form, giving a comprehensive list of all publications on Egyptology, including journal articles and chapters in edited volumes. Each entry is provided with an abstract. All volumes from 1947 to present have been transferred to a digital format. The AEB website makes publications from 1992 onwards freely available. The UEE and the AEB have initiated a close cooperation.
http://www.leidenuniv.nl/nino/aeb.html

Deir el-Medina Database

Funded by the Netherlands Foundation for Scientific Research (NWO), this database enables searches of the content of the *ostraka* (limestone flakes used as cheap writing material) of Deir el-Medina, the village of the artists and workmen who built the tombs of the New Kingdom Pharaohs in the Valley of the Kings in Thebes (see below: Theban Mapping Project). The scope is specialized as the Deir el-Medina Database is concentrated on finds from one site in Egypt. For the UEE this will be an excellent resource, to which we can provide a link from various articles.
http://www.leidenuniv.nl/nino/dmd/dmd.html

Digital Egypt for Universities

Funded by the Joint Information Systems Committee (JISC), a division of the UK Further and Higher Education funding councils, a website has been created by the University College London for the Egyptian collection of the Petrie Museum. According to the website "The primary aim of the website is support for learning across different disciplines - including learners and teachers who may know nothing about, or even be interested in, Egypt." In contrast, the prime focus of UEE is on Egyptological professionals and students, but, as stated above, it will avoid jargon and will be accessible to colleagues and students in other disciplines. Cooperation between the two initiatives may prove beneficial for both (see attached letter of Dr. Stephen Quirk).
http://www.digitalegypt.ucl.ac.uk/Welcome.html

Egyptological Resources
This is a website maintained by the Egyptologist Nigel Strudwick (Cambridge University), which includes a message board, links to important Web resources for Egyptology, and an e-mail list of members of the International Association of Egyptology. This site does not present data, but many relevant links to other sites. http://www.newton.cam.ac.uk/egypt/

Eternal Egypt
With the help of a $2.5 million grant of technology and expertise from IBM, a website has been created by the Egyptian Center for Documentation of Cultural and Natural Heritage (CultNat), in cooperation with the Egyptian Supreme Council of Antiquities and the Library of Alexandria. The site is attractive and well-planned and incorporates many multimedia features. It is designed for a general audience, whereas the UEE is addressed in the first instance to a scholarly audience. In a future phase options for cooperation with this site for the K-12 and nonacademic part of the UEE will be explored. http://www.eternalegypt.org

Griffith Institute
The Griffith Institute, Oxford University, specializes in Egyptology and Ancient Near Eastern studies. Several of its important collections can be accessed online, such as the Egyptological archive, the Topographical Bibliography, the complete archive of the finds from the tomb of Tutankhamun, and collections of early photographs. http://www.ashmol.ox.ac.uk/Griffith.html

Middle Egyptian Text Editions for Online Research
Edited by Janet Johnson and Michael Berger, of the Oriental Institute, University of Chicago, the *Middle Egyptian Text Editions for Online Research* (METEOR) provides critical editions and translations of important Middle Egyptian texts, linked to relevant geographical, archaeological, and historical information. This project includes a search function on hieroglyphic texts. The database is part of the XSTAR initiative (see section 4.2.4.3 below).
http://www.oi.uchicago.edu/OI/PROJ/MET/Meteor.html

Theban Mapping Project
Funded mainly by the American University in Cairo and by individual donors, the Theban Mapping Project has developed very valuable database with detailed information on the famous royal tombs of the New Kingdom in Thebes. Information on the tomb decoration and publications is connected to attractive and useful visual materials. Its scope is different from that of the UEE, but it would be excellent to provide links from related entries to this website.
http://www.thebanmappingproject.com/

Tour Egypt
The website that scores the highest in *Google* searches on Egyptological subjects, Tour Egypt, appears to be funded by the Egyptian Ministry of Tourism and the Egyptian Tourism Authority through the Association of Egyptian Travel Businesses on the Internet. With an emphasis on travel, the website offers a wide array of pages that deal with the history and culture of ancient Egypt. The information is quite extensive, but it is unclear who the authors are. The purpose and content are different from those of the UEE. This site would not be the most important candidate for close cooperation, as there is no review process, version control, or archiving.
http://touregypt.net/egyptantiquities/

Existing Egyptological resources, both in print and on the Web, differ in size, scope, and intended audience from the UEE, which will offer the most current scholarly standard, while stimulating disciplinary innovation and providing access for a wider audience than just professional Egyptologists.

4.2.4.3 Digital repositories on the Web

Several Web resources contain large collections of digital information in related fields of study that are of great interest to the editors and developers of the UEE. Presented here is a small selection; many others sites offer useful insights in the employment and potential of information for the humanities on the Web.

Advanced Papyrological Information System (APIS)

APIS (Project director Traianos Gagos, University of Michigan) links together various sources of information about texts written on papyrus and the society that produced them. It contains descriptions of the papyri and other written materials in the collections of the participating institutions, digital images of many texts, and connections to databases with the texts themselves in their original languages with bibliography. With the specially-developed APIS Search System many types of complex searches can be carried out. In May 2004 the database contained 20,498 records and 13,733 images.
http://www.columbia.edu/cu/lweb/projects/digital/apis/index.html

Cuneiform Digital Library Initiative (CDLI)

Based in the department of NELC at UCLA and directed by Robert Englund, the CDLI represents the efforts of an international group of Assyriologists, museum curators, and historians of science to make available through the Internet the form and content of cuneiform tablets dating from the beginning of writing, ca. 3200 BCE., until the end of the third millennium BCE.
http://cdli.ucla.edu/

Electronic Tools and Ancient Near Eastern Archives (ETANA)

This project, hosted by Vanderbilt University Library, is a cooperative venture of a consortium of scholarly societies and universities to develop and maintain a comprehensive website for the study of the ancient Near East. ETANA is envisioned to include the permanent archiving of public domain scholarly knowledge such as excavation reports, editions of ancient and modern texts, core early monographs, dictionaries, journals, and reports. http://www.etana.org/

Perseus Digital Library

One of the main humanities repositories on the Web is the Perseus Digital Library, formally established in 1987. The collaborators initially aimed to construct a large, heterogeneous collection of materials, textual and visual, on the Archaic and Classical Greek world. By now the digital library has broadened out and gives access to archives ranging from the American Civil War to those of the excavation of Giza by the Museum of Fine Arts in Boston. The primary goal is to bring a wide range of source materials to as large an audience as possible. http://www.perseus.tufts.edu/

XML System for Textual and Archaeological Research (XSTAR)

The goal of this project, initiated by David Schloen and Gene Gragg of the University of Chicago's Oriental Institute, is to create a sophisticated Internet-based research environment for specialists in textual and archaeological studies in the Near East. In particular, XSTAR is intended for archaeologists, philologists, historians, and historical geographers who work with artifacts, documents, and geographical or environmental data. It will not only provide access to detailed, searchable data in each of these areas individually, but will also integrate these diverse lines of evidence as an aid to interdisciplinary research. www.xstar.org

Stanford Encyclopedia of Philosophy (SEP)

The SEP was started in 1995 as a dynamic reference work in which each entry is maintained and kept up to date by an expert or group of experts in the field. All entries and updates are refereed

by the members of an editorial board before they are made public. This makes the SEP responsive to new research, while making it possible to cite fixed editions, which are made on a quarterly basis and stored in the archives. Editor-in-Chief is Edward Zalta (Stanford University), and Associate editor Colin Allen (Indiana University). http://plato.stanford.edu/contents.html

Faced with many of the same decisions regarding sustainability, search functions, and workflow schedules, close cooperation with several of the projects listed above is envisioned. This is exemplified by the involvement of Robert Englund (CDLI), Edward Zalta and Colin Allen (SEP), Willem Hovestreydt and Hans van den Berg (AEB) in the Technology Committee, and by inviting Stephan Seidlmayer (*Altägyptisches Wörterbuch)* and Janet Johnson (METEOR, XSTAR) to participate in the Academic Editorial Committee.

4.3 Methodology and Standards

4.3.1 Development of Content

4.3.1.1 Selection of Authors, Copyright of Texts and Illustrations

For each entry the Academic Editorial Committee will assign a specialized author, who will be chosen for expertise in the topic and will be paid a modest honorarium ($100 for 1000 words) upon submission of their entry. The commissioned articles will be considered "works-for-hire" and the copyright will be assigned to The Regents of the University of California on behalf of the UEE (see contract, Appendix E). Authors whose contributions involve their own fieldwork will be asked to provide high quality images and give permission to include these in the UEE. The images will be watermarked with a provision that they can only be used for non-commercial purposes.

Implementation Phase 1 concentrates on the text entries. In Implementation Phases 2 and 3 the UEE will continue building an image database and negotiate conditions under which different museum collections will make images of their collections available. This process will gain momentum once the UEE has established itself as a core repository of Egyptological knowledge. The image database will be an important part of the UEE, as it will not only illustrate the textual entries, but also function as repository for data on the archaeology and material culture of ancient Egypt. The database will be one step toward a virtual reunification of the material heritage that is dispersed over museums around the world.

Interactive maps will be generated where relevant for the entry from the geographical position system coordinates (GPS). The metadata of the entries are part of the Geographical Information Systems (GIS), so that search results can be presented as geographical data and spatial relations, rather than just text. Clickable maps provide links to the textual or pictorial information. For each major period of Egyptian history key ancient sites, and some modern cities, will be incorporated automatically to provide reference points. The maps can be used to zoom in to a specific area, with gradually increasing detail, based on the present landscape and linked to information about the ancient sites.

4.3.1.2 Academic Editorial Committee

The Academic Editorial Committee consists of leading Egyptologists, listed in section 7. Its tasks are to establish and maintain the overall concept of the encyclopedia, determine entry and composition codes, select area editors and authors, and provide them with directions to assure well-balanced and complete information on each subject. Selection criteria for authors and area editors are their academic record and standing, as well as their publications on a specific sub-field or subject.

The Academic Editorial Committee will guide the process of review and permission to publish and will check the criteria for website assessment. These criteria are used to determine which websites will be linked to specific encyclopedia entries, as well as teaching students and other users to assess the quality of Web content.

4.3.1.3 Technology Committee

The Technology Committee consists of editors and staff of comparable online repositories, as well as staff members of the information technology departments within UCLA that are involved, listed in section 7. This committee gives advice on the programming developments of the project. During the first year of the current two-year project, the repository and access programming, which is XML based, will be developed to coincide with the arrival of the content (commissioned articles) from spring 2007 onward. The second half of the grant period will be used to increase the speed and versatility of the project.

4.3.1.4 Generating Entries

Entries are generated through a hierarchical grouping of facets that forms the conceptual back-bone of the UEE. A draft of the taxonomy used to select the first 500 entries is outlined in Appendix B. The development of this taxonomy is in progress as part of the pilot phase. The final form of this taxonomy and the full selection of entries will be available in Spring 2006, before the start of the Implementation Phase 1.

Providing entry guidelines for authors

Authors are asked to pay explicit attention where relevant to social aspects such as: gender and ethnicity; the earliest and latest occurrence of the object / phenomenon; material and technology; function and meaning; origin, development, and sources of modern knowledge. In addition, authors are asked to pay special attention to interdisciplinary aspects of each subject. For each entry discipline-specific subject fields are determined and added as a code. Through these codes the editors determine the content outline for the entries and alert authors to aspects that should be highlighted. The Entry Composition Codes are generated through the following matrix:

Disciplines (alphabetical) ↓	Subjects → (alphabetical)	A. Activities	B. Events	C. Language	D. Mat. Cult.	E. Nature	F. Persons	G. Places	H. Supernat.	I. Thought
1	Anthropology	A1	B1	C1	D1	E1	F1	G1	H1	I1
2	Archaeology	A2	B2	C2	D2	E2	F2	G2	H2	I2
3	Architecture	A3	B3	C3	D3	E3	F3	G3	H3	I3
4	Art History	A4	B4	C4	D4	E4	F4	G4	H4	I4
5	Biography	A5	B5	C5	D5	E5	F5	G5	H5	I5
6	Biology	A6	B6	C6	D6	E6	F6	G6	H6	I6
7	Economy	A7	B7	C7	D7	E7	F7	G7	H7	I7
8	Geography	A8	B8	C8	D8	E8	F8	G8	H8	I8
9	Geology	A9	B9	C9	D9	E9	F9	G9	H9	I9
10	History	A10	B10	C10	D10	E10	F10	G10	H10	I10
11	History of study	A11	B11	C11	D11	E11	F11	G11	H11	I11
12	Legacy	A12	B12	C12	D12	E12	F12	G12	H12	I12
13	Linguistics	A13	B13	C12	D13	E13	F13	G13	H13	I13
14	Method of study	A14	B14	C14	D14	E14	F14	G14	H14	I14
15	Philology	A15	B15	C15	D15	E15	F15	G15	H15	I15
16	Religion	A16	B16	C16	D16	E16	F16	G16	H16	I16
17	Science	A17	B17	C17	D17	E17	F17	G17	H17	I17
18	Sociology	A18	B18	C18	D18	E18	F18	G18	H18	I18
19	Technology	A19	B19	C19	D19	E19	F19	G19	H19	I19

The entry composition codes are determined by the Academic Editorial Committee. An example follows and several others can be found in Appendix B.

The entry on *snake* was given the Entry Composition Codes **E6** (the snake as a natural phenomenon studied through the discipline of biology); E1 anthropology (protection against snakes in daily life, snake charmers); E3 architecture (incorporation of snakes in building decoration); E4 art history (snakes as subject for art forms and decorative motive); E12 legacy (the snake as cultural icon of ancient Egypt, snake bracelets); E15 philology (the use of snake hieroglyphs in the script, snake spells); E16 religion (snake gods and goddesses, the meaning and religious function of snakes); E17 science (ancient medicinal treatment of snake bites), and E18 (the snake as symbol of royalty). By looking at other entries for which the main code is E6, or by looking at entries that have a selection of the same range of codes, cross references are made to topics for which the same features are studied.

The Entry Composition Code system was developed specifically for the UEE, in order to enable the editors to control the focus and scope of the entries without diminishing the academic freedom of the authors. The system has been tested on approximately 50 entries and found functional. During the remainder of the pilot phase the system will be put fully to the test. Its use for generating related topics (see below) can only be established after a considerable number of entries have been put into the system.

Generation of related topics

The UEE Full Version will provide several ways for readers to explore related terms. As is expected in this type of online reference work, readers will find clickable links in the text to articles on the highlighted terms. They can also do single or multiple keyword searches. In addition two types of related topics are generated: one through the hierarchically structured conceptualization topics and the second through the Entry Composition Code matrix. The first type is content-related, the second is discipline or approach related.

The content relations are defined by the taxonomy in terms of 'synonym', 'antonym', 'is a type of', 'has types', 'is a part of', 'has parts'. In the case of our example: snake (A) is a type of reptile (group Δ), is part of the group *crocodile, gecko,* and *lizard* (B, C, D) and has types *cobra, horned viper,* and *python* (x, y and z, etc.). Thus the related topics that are generated can be equal (crocodile), more general (reptiles), or more specific (cobra).

	Δ	A-D	x-z
FAUNA	Reptiles	**Snake**	Cobra
			Horned viper
			Python
		Crocodile	
		Gecko	
		Lizard	

4.3.2 Preparation and Processing of Material

4.3.2.1 Introduction: Summary of Tools and Technologies

The project team plans to address the challenges of document creation, editing, preservation, and dissemination with a hybrid approach that leverages existing technical strengths and specializations at UCLA, while supplementing and extending those strengths by drawing on initiatives that determine and maintain standards among all US educational institutions – most notably the Metadata Encoding and Transmission Standard (METS) initiative led by California Digital Library (CDL), eScholarship (also led by CDL; see section 4.3.2.2), the protocols of the open source learning-management system SAKAI, and DSpace (see section 4.3.3.3).

Key elements in our existing technology are the UCLA Digital Library System (DL, see Appendix F), a robust platform for text, image, and audio preservation and access, and the

experience of the Center of Digital Humanities (CDH) in creating visual learning objects.[1] An example is CDH's success in developing a time-map application that displays both text and images over the web, in addition to enhancing the learning environment by adding a cultural element to the course. CDH developers used Zoomify (http://www.zoomify.com) to create maps that allow students to navigate through time and space using a Flash client over the web. This project, focusing on the city of Berlin, can be accessed at http://www.berlin.ucla.edu (click on "student login"). These two aspects of UCLA technical work will be extended by CDL initiatives to create our primary means of dissemination: one allows public access to the individual articles published as a peer-reviewed series in eScholarship (UEE open version), the second allows web access to individual objects within UEE's full version (DL), and the third, created at CDH, will integrate visual and textual content with enhanced display, navigation, search, print and download functionality.

We intend to create an interface that will make use of an abstraction layer[2] to "hook" into the DL environment (Java plus Oracle) where all source digital objects (digital texts marked up in TEI or another XML text markup standard; images; audio; video; etc.) with their added metadata will be stored. The DL will, in addition, allow us to provide various levels of access to these components (e.g. keyword and Boolean searching, and browsing via selected indexes) for different groups of users. In this way, authors who are contributing articles can be given access to components that have already been submitted to the UEE allowing them the opportunity to build on fresh data. Digital assets will be exposed for harvesting using the Open Archives Initiative Protocol for Metadata Harvesting. More complex learning objects, i.e. ones that include variant paths (depending on context) through an object, will be stored in the Learning Object Repository (DSpace). UCLA's implementation of DSpace is already capable of supporting Digital Object Identifiers (DOI), but the UCLA installation will be slightly modified to accommodate Archival Resource Key (ARK: http://www.cdlib.org/inside/diglib/ark/), a California brand of DOI designed to ensure permanence of objects within the University of California system. The ARK identifier is a naming scheme for persistent access to digital objects (including images, texts, data sets, and finding aids), currently being implemented by CDL for collections that it manages. The identifier associates a string with an information resource such as a METS file which in turn defines the characteristics of the resource as a unique, actionable URL. CDH's interface will thus "pull" from simple objects served up by the Digital Library Systems, or from more complex objects stored in DSpace, integrating these into a comprehensive multi-media environment.

4.3.2.2 Document Preparation and Editorial Process

Authors can submit commissioned articles directly to eScholarship using a web-based interface, or they can send them to UEE's editor, who will upload them into the eScholarship system. Once inside eScholarship, the peer-review process begins. When the article is published as a PDF file in the UEE Open Version, the final version is also sent to the UEE editors for markup and inclusion in the UEE Full Version.

eScholarship

The UEE Open Version is published through eScholarship, a scholarly web-based publication platform (http://repositories.cdlib.org/nelc/uee/). The traditional model of scholarly communication is based on journal publications, and in the current age, it has become expensive, restrictive, and increasingly limited in its ability to make information accessible. To address these

[1] Current projects accessible within the UCLA Digital Library System can be viewed at http://digital.library.ucla.edu. See especially the Frontera and Sheet Music projects.

[2] This will ensure the portability of the user interface since it can easily be moved to handle a variety of backend systems by simply modifying the abstraction layer.

concerns, the eScholarship program was initiated by the California Digital Library at the University of California. This program facilitates innovation and supports experimentation in the production and dissemination of scholarship. EScholarship offers on-line tools for the creation, peer review, management, dissemination, and preservation of digital content (http://www.cdlib.org/programs/escholarship.html). The complex challenges of the input side of the encyclopedia (see the work flow chart of the editorial process, Appendix D), preserving and accessing versions of articles as document objects and making these available to collaborators, will be handled by eScholarship. By publishing the UEE entries as peer reviewed articles through eScholarship, a larger audience will have public access and be made aware of these contributions and can be guided to the full version which will provide them with more illustrations and enhanced research tools.

Mark-up and Incorporation into the Digital Library System

Descriptive standards for the encyclopedia will be 'locked' into the editorial process with a relational database that can be used to track commissions and editing of articles through the process. This database will also be used by the editor to enrich subject access by revising and adding keywords within controlled groupings that correspond to the various 'ontologies' of the work (as described in section *4.3.1.4 Generating Entries* and Appendix B). This will ensure that the content can be viewed from a variety of points of view – linguistic, temporal, proper name, lists of headings, and so on. In addition, simple and complex keyword searching will be supported by Oracle Intermedia tools.

Not all required functionality, however, can be guaranteed with database technology. For example, it will be too laborious to predict all possible uses of articles and attempt to embed these in descriptive metadata. It will be necessary to begin a process of building an XML (Extensible Markup Language) Schema for the encyclopedia at an early stage so that the articles can assume a consistent data model within which we can reference material that is external to the text – images, maps, references to other sites, bibliographic resources, and possibly dictionary resources within the Berlin *Altägyptisches Wörterbuch* and the METEOR project at the University of Chicago Oriental Institute.

XML will not be regarded as a standard in itself, but rather as a low-level markup language that can evolve to support the complexities of the project and guarantee that the content will always be re-usable in different contexts. It will be possible, for instance, to represent the encyclopedia as a METS object by using the external Dublin Core (DC) metadata and the Digital Library structural principles. We will, as we develop our schema, actively seek out other people developing large reference works, and seek advice from others working in the field of archeology to determine what they see as essential elements in an encyclopedia schema. Creation of a re-usable XML Schema for other humanities encyclopedias will be an important goal of the project.

The formal process of conceiving and commissioning an encyclopedia will lend itself to the internal effort to create an ideal, consistent document framework. The project team will initially work to describe an article with as few elements as possible so that those elements can become the building blocks of functionality. Given that image and graphics content will initially be added to the text in a highly selective way it is probable that we shall point from within the XML Schema to other distinct XML schemas for images and maps that will always reside on another server, and can be used quite independently of the text itself.

4.3.3 Organization of and Access to Material

4.3.3.1 Managing Descriptive Metadata

Because the editor will map out the content of the work in hierarchically organized article headings, each corresponding to a single document connected to the whole by pre-determined associations, a large part of the descriptive metadata can be managed by a relational database from the outset. This part of the work will not essentially differ from the start-up process of

SGML-based encyclopedias. Use of persistent IDs assigned by the database, and logical identifiers that reflect the intellectual organization of the work can capture the structure in logical and intellectual groupings. The database schema used by the editor will exactly match the Digital Library architecture so that content can be migrated easily between the editorial process and the Digital Library system.

The following table sketches out Dublin Core descriptive metadata supported by the UCLA Digital Library System based on the sample article. The table is not intended to present an exhaustive account of the descriptive metadata, but gives an idea of how documents can be presented to users, and how the resource can be made interoperable in Open Archive Initiative (OAI) services:

		Qualifier	Comment
Primary Key/Identifier		AltIdentifier	
	AltIdentifier	X	Can reference the article in another system such as a CMS, or refer to another version of the text.
Title		AltTitle	Article Heading (in English)
	AltTitle	X	Article Heading (in Arabic)
	AltTitle	X	Article Heading (in German)
	AltTitle	X	Article Heading (in French)
Description		AltDescription	Abstract in Arabic
Publisher		X	UCLA
Date		DateType	
	DateType	X	(e.g. date of submission, date of revision)
Type		X	
Format		FormatType	
Source		SourceType	
Language		X	
Relation		RelationType	
	RelationType	(e.g.)Is part of	Use to map associations between articles.
	RelationType	(e.g.) has parts	
Coverage		CoverageType	
	CoverageType	X	geospatial
	CoverageType	X	temporal
Rights		X	Use to control access.
Subject		SubjectSource	
	SubjectSource	X	Use to control keyword lists from various hierarchies as directed by the editor.
	SubjectSource	X	"
Name		NameRole	
	NameRole		(e.g.) editor, contributor, reviewer.

4.3.3.2 Controlled Vocabularies and Taxonomies

The development effort outlined above will produce a hybrid work: basic discovery by assigned metadata depends on standard Dublin Core description; more complex functions such as displaying images and maps, displaying information in non-western languages such as Arabic or hieroglyphs, or retrieving values embedded in text, will rely on an XML Schema that will reside in the database as a text object and display to the user through an XSLT (Extensible Style Language Transformation) processor.

One of the most unusual and demanding aspects of the editorial plan is the intention of providing perspectives on the work from the standpoint of multiple disciplines whose "ontologies" will be represented by meticulously constructed hierarchies that are connected to one another laterally. The project team considers that a cost-effective strategy for managing this aim will be to support the editor in storing terminology in a late model database-supported thesaurus organizer such as one of the Web Choir suite of products (see Appendix B), and then transferring this terminology to the XML framework of the articles themselves within groupings defined by multiple XML namespaces. By this means, any grouping of terms within the XML document can be referenced to a particular hierarchy, and a mapping between articles in the work and that hierarchy can be accomplished with an XML topic map that contains both terms and the article identifications with which they are associated.

4.3.3.3 DSpace

The DSpace project, led by MIT (http://www.dspace.org/), is a national initiative primarily designed to preserve and provide access to academic intellectual property, including the class of digital objects summarized as "learning objects." As much a movement as a technology, its specific features will be designed and built by a community that is pursuing a variety of objectives, but its principal objective to provide institution-based storage of scholarly material in a style that is cumulative, persistent, and interoperable.

Key features of DSpace 'out of the box' include its ability to capture almost any file format or document type directly from faculty without the intervention of any standards-based filtering effort; support for descriptive, technical, and rights metadata; ease of content distribution on the Web with access control; and the capacity to use persistent network identifiers.

Work on a UCLA implementation of DSpace to create a repository of IMS-LOM learning objects is supported by the terms of a grant from the California Digital Library (CDL), and expertise acquired in this area can be leveraged to apply to preservation and access issues surrounding the UEE.

4.3.3.4 Search and Access: from Traditional to Innovative

The power of digital information, both textual and pictorial, lies in the superior search and retrieval capabilities of digital tools for access and analysis. The UEE combines two approaches that represent the two extremes of the search and access scale. On the one hand the precisely defined taxonomy, which points the user to very specific content, while on the other the latest developments in data mining are incorporated in the design of cutting edge search capabilities of the UEE. Both approaches will generate new knowledge and research paths. By offering new, interactive and non-linear search methods, the UEE provides a more valuable and engaging environment to access the stored information. The traditional format of the UEE, with its relatively brief articles presented in an alphabetical order, seems to be in contrast with the purpose of creating an innovative research and teaching tool. This format was chosen with the purpose to involve the entire Egyptological community, including those who are not inclined to use the Internet as a source of information, or are skeptical about the use of digital media. In order to interest less computer-savvy colleagues the UEE offers a very basic search option that remains close to the look and feel of a traditional encyclopedia. The digital format of the UEE also offers traditional browsing, similar to a printed encyclopedia, where interesting entries are found serendipitously on the opposite page from the actual subject under study, or a few pages away. Added features will be the 'random browse mode' where a random selection of entries appear in a sidebar, as well as a 'related browse mode' where the sidebar shows related subjects, determined through the hierarchical structure underlying the selection of entries. Unobtrusive highlighting of subjects in the text provides a convenient access to related entries.

Although the text entries of the UEE are written in English, users can choose one of four access languages. Arabic pull-down menus give access to the brief identifications (fact files) in

Arabic. French and German pull-down menus transfer the reader to the full entries in English. The advanced search options that will be available at the end of Implementation Phase 1 are the following:

- Search on entry title in four languages
- Text search on the fact-files (brief identifications)
- Full text search
- Multiple Keyword search
- Metadata search (author, subject, period, material)
- Map search
- Test phase for spatial interactive searches (linking text entries to 3D models)
- Test phase for links between articles and original data (excavation records)

In Implementation Phase 1 map searches are to be performed through clickable maps that can zoom in on specific regions or sites. These provide links to articles in the encyclopedia on specific regions, sites, or monuments. In addition, interactive plans and models will be part of several entries on specific monuments and archaeological sites.
In future phases these search options will be expanded with:

- Related topic search
- Image database search
- Weighted keyword search / text analysis
- Data mining
- Maps based on Geographical Information Systems (GIS)
- Real time Virtual Reality models

One approach that we will explore as a way of incorporating innovative ways of navigating the encyclopedia is to experiment with data mining and visualization tools such as T2K (Text to Knowledge) http://alg.ncsa.uiuc.edu/do/tools/t2k, *Info Navigator*, a forthcoming functionality of the Greenstone Digital Library http://www.greenstone.org, or topic maps such as Omnigator http://www.ontopia.net/omnigator/models/index/jsp. We will explore other options such as Oracle's Intermedia, as well as 3D schematic renderings. This last option will allow users to search without needing to be familiar with specialized vocabulary and will likely become a useful classroom tool. The UEE will be flexible in its approach, and will keep abreast of the rapid developments in the field of Digital Humanities. The options listed here are likely to be only some of those available in the future.

4.3.4 Sustainability: Repository and Finances

There are two distinct aspects to the task of long term preservation: ensuring the survival of documents and file formats such as images and maps; and sustaining the work as a constantly growing and constantly accessible repository of information about Egyptology contributed by many hands. Preservation of text and images will rely on the UCLA Library Storage Area Network (see Appendix F), and on the Open Archival Information System (OAIS)-compliant archival procedures offered by the Storage Resource Broker, a national initiative for Internet grid-based archiving headquartered in San Diego. In addition, long term sustainability rests on regular updates and a sound financial backing.

4.3.4.1 Updating and Version Control

Content update and version control are important issues in the development of the *Encyclopedia of Egyptology*. Experience with the *Lexikon der Ägyptologie* has shown that within 20 years new discoveries and developments in the discipline have changed the field to such an extent that not only the bibliography and the information within the entries, but often also the nature and type of the entries need updating. Each entry has the status of a peer-reviewed scholarly article, and the articles from the encyclopedia are expected to be quoted widely in both web-based and printed

articles and books. When an article is updated, the version number will indicate that this has been done, while the old version will continue to be accessible through the archive section of the web site, giving the added benefit that over time UEE will record the history and the scholarly development of the profession.

Regular updates of the encyclopedia entries will be initiated by the Academic Editorial Committee, and can also be initiated by the author. For each entry the system will send out an automatic alert five years after it is 'published'. At that juncture the editors will check whether the entry needs updating. Updates will be numbered according to author and version. Version 1.1 is the first text of the first author, 2.1 is the update by the same author, 3.2 is the third edition, updated by a different author. Depending on how much the entry has changed, the Academic Editorial Committee will decide to publish the entry under both author names, or solely under the name of the new author.

Additions of new and retirement of redundant entries will be decided on by the Academic Editorial Committee. They will base their decisions on developments in the field. The editors will also take into account suggestions by the users, through the interactive part of the UEE. The UEE has an interactive screen through which users can communicate their suggestions for new entries, different approaches, user-friendliness of the search environment, etc. to the editors.

4.3.4.2 Financial Sustainability

While the result of the Implementation Phase 1 is an up-to-date and attractive Web resource, with immediate value, we envision a long life for what we plan to become the new standard of Egyptological knowledge. Financial sustainability is therefore an important concern. In order to ensure long-term viability, the UEE will need to adopt a cost model that can cover the necessary expenses to procure new content, including (but not limited to) editorial and technical costs. However, the cost recovery methodology selected must not impede the dissemination of the core information gathered and stored within the UEE, because this would contradict both the mission of the UEE and the spirit of several underlying technological components.

The editors have considered and dismissed the option of housing the UEE with a commercial publisher. The main reasons are that the core content should be freely available to the public, that a commercial publisher may be forced to cut costs and cannot offer the best guarantee for long term storage, maintenance and upgrades. On the other hand, the UC system, with its infrastructure built in eScholarship and the California Digital Library, offers long term guarantees and allows us to give public access to the core information.

The UEE will work during Implementation Phase 1 to research, develop, and adopt a financial sustainability plan based on two levels of access: free public access to core UEE materials and functionality; and an 'enhanced' access to UEE members. As a way of ensuring that UEE can continue to pay contributors and keep content current, we will explore several possibilities:

- Endowment: work to identify and secure an endowment sufficient to cover these costs
- Membership: implement a system in which membership fees and donations are pooled to cover costs, with any surplus being directed toward an eventual endowment
- Diversified funding: work to identify and secure other sources of funding
- Subscription: institutions pay for enhanced access or functionality

As a way of encouraging subscriptions and membership, UEE will explore options of providing enhanced functionality, such as interactive 3D navigation, markup suitable for import directly into course management systems, printable or DVD versions, downloadable archives, and access to larger scale images and models. Non-contributors will still be able to search and display results, but they will also be made aware of the 'enhanced' access level. Search results could, for example, be displayed with a thumbnail image, that will appear full-size to members of a subscribing institution.

Enhanced access may be an incentive for other institutions to form partnerships with UEE. In exchange for such access, museums that house sizeable Egyptian collections might consider contributing access to images of their artifacts, including ones that UEE could transform into 3D models that would be accessible to museum patrons.

The core content of UEE is to be freely accessible to the general public. The UEE will seek out ways to ensure long-term success by focusing on enhancements, customizations, or supplements that provide additional value to the freely available content.

4.4 Plan of Work

Two year project from June 1, 2006 – June 1, 2008

The technical approach proposed by the working team is designed to form the basis of all the editorial actions, and will also support all stages of designing subject coverage by the project editor (see Appendix D work flow scheme). Work on the pilot project by CDH started in January 2005. By the time the grant begins in June 2005, we will have built and tested the pilot as described in section 4.2.1. The Plan of Work indicates the specific tasks of the technical staff. HB = Dr. Howard Batchelor; MB = Matthew Bazar, ZB = Dr. Zoe Borovsky; CF = Curtis Fornadley; HC = Henry Chiong; SH = Shawn Higgins; EH = Eugene Horikawa; HW = Hannah Walker. The pilot phase is listed here, to demonstrate that this time schedule is realistic.

Pilot Phase

January - December 2005

- Members of the Academic Editorial Committee and several other Egyptologists submit articles to be used for testing the online editorial system, the database, the mark up and the search functionalities.
- Gather metadata for article headings, creator names, and subject classification using the Dublin Core descriptive framework of the encyclopedia. (HB)
- Create a typology for sample articles as a Document Type Definition (DTD), determining tags. Consider special requirements of DTD and work toward formulation of an XML schema to express a standard structure and attributes. (HB, EH, ZB)
- Create document management principles for keying of additional metadata by project editors, and XML validation under the supervision of the DL technical lead. (HB, EH, ZB)

January 2006-May 2006

- Design and construct catalog/repository system for media objects, i.e., image, audio, video, 3D, etc. (EH, MB, CF, HC)
- Development and refinement of search structure (EH, MB, CF, HC)
- Allocate backend system storage, both temporary, and permanent (HB)
- Design and construct abstraction layer that interfaces between user interface and storage system. (HB, EH, MB, CF)

Implementation Phase 1

June 2006

- Hiring editorial assistants (Graduate Student Researchers) for training in metadata mark up, management of the review flow, and assessment of external websites
- Training of GSRs in XML markup. (HB, ZB)

July 2006

- Three day meeting of the Academic Editorial Committee and the Technology Committee to coordinate and train in the workflow. Assigning roles, areas and responsibilities. A number of Area Editors will be added to the editorial team, recruited from within and without the Academic Editorial Committee. Start of author assignments.

- Commissioning 500 entries, automated correspondence with authors.
  Deadline for the first group of 100 contributions will be January 2007.
  The editors realize that a period of two years to obtain, review, copy-edit and publish 500 entries is tightly planned. To enhance the level of success, mostly brief, factual entries will be commissioned from authors who are well versed in a specific subject and should be able to write 500 – 1500 words with ease. Longer, synthesizing articles on broad subjects will be commissioned in Implementation Phase 3.

September – October 2006

- Editorial Assistants locate, select and annotate external websites; assist with contacts.
- Develop and finish article group submitted before December 2005 (by Editorial Academic Committee members) to be published in eScholarship. The main purpose of this stage will be to expose metadata about the project to a wide audience in order to gain attention and encourage contribution. (ZB, HW)

October – December 2006

- Further development and refinement of search structure. (HB, MB, CF, HC, SH)
- Selection and recruitment of reviewers.

January – June 2007

- Review process for encyclopedia entries through eScholarship (see Appendix D)
- Hiring of copy editor who will enforce style, check references and overall consistency; corrects grammar and spelling. The editorial assistants add metadata to approved entries.

July – December 2007

- With the substantial amount of content that has been created to the standard of the XML Schema, text content will be uploaded to the UCLA Digital Library architecture.
- Complete beta end-user interface. (MB, EH, CF, HC, SH)

January-March 2008

- Finalize encyclopedia XML Schema Definition (XSD). (HB, CF, HC, ZB, EH, SH)
- Testing of views of the schema. (SH)

June 1, 2008

- Complete final end-user interface, launch of UEE Full Version (HB, CF, HC, MB, EH, SH)

4.5 Staffing

Editorial staff:

Dr. Willeke Wendrich	Editor	UCLA	20% June 2006 - 2008
		NEH	summer 1/9 2007/08
Dr. Jacco Dieleman	Co-editor	UCLA	10% June 2006 - 2008
Dr. John Baines	Senior Editorial Consultant	NEH	consultancy
Dr. Michael Cooperson	Arabic translations supervisor	NEH	5% May 2007 - 2008
TBA	Assistant editor	NEH	75% June - Aug 2007
Gina Dubois	Copy editor English	NEH	100% June 2007 - 2008
Mohsen Kamel	Copy editor Arabic	NEH	100% Feb - April 2008
Editorial assistants:			
TBA	2 GSRs	NEH	25% June 2006 - 2007
	(9 months and 3 summer months)		
	2 GSR		
	(9 months and 3 summer months)	NEH	50% May 2007-2008
TBA	Research Mentorship	UCLA	50% June 2006 - 2008
Technical staff:			
Dr. Zoe Borovsky	manager CDH	UCLA	20% June 2006 - 2008

Shawn Higgins	designer CDH	UCLA	15%	June 2006 - 2007
			40%	May 2007 - 2008
Eugene Horikawa	programmer CDH	UCLA	15%	June 2006 - 2008
Matthew Bazar	database programmer CDH	UCLA	10%	June 2006 - 2007
Dr. Howard Batchelor	Digital Library Coordinator	UCLA	10%	June 2006 - 2007
Curtis Fornadley	Digital Library Programmer	UCLA	20%	June 2006 - 2008
Henry Chiong	Digital Library Programmer	UCLA	5%	June 2006 - 2008
Hannah Walker	Digital Library Librarian	UCLA	4%	June 2006 - 2008

Associate Professor Willeke Wendrich will be the lead editor for the encyclopedia and will be responsible for the overall conduct of the project to ensure that timelines are met and for supervising the project staff and students. She has extensive experience with international scholarly cooperation and has edited several books. Effective June 2005 she was appointed head of the Digital Humanities Research Group at UCLA, a new organization to advise and support faculty with the development of digital research projects in the humanities. The Dean of Humanities has provided initial funding for three years. Assistant Professor Jacco Dieleman, co-editor, will also supervise the work of the project staff and students and will participate fully in all stages of the work, enabling him to assume Wendrich's responsibilities, for instance when she is in Egypt for excavations. The third editorial position is that of the senior editorial consultant John Baines, Professor of Egyptology at Oxford University who has longstanding experience as contributor and editor of works of reference, including the sections on Egypt in the encyclopedic *Civilizations of the Near East* (Sasson 1995). He will be involved in developing the search functionalities and in decisions on the content and selection of experts who will function as area editors and contributors. Associate Professor Michael Cooperson will supervise the students of the NELC translation program during their assignments of translating the brief identifications / fact files from English into Arabic.

Two Egyptology Graduate Student Researchers (GSR) will be hired each year as assistants to the editorial team. One of these will be responsible for tracking entries by maintaining the workflow database, a task that will be light in the first year, but will intensify in the following years. In addition, the GSRs will: enter metadata; work on 3-D models; identify and create maps; seek and obtain copyright clearances, and assist in assessment of websites with Egyptological content. The student holding the research mentorship will participate in the development of a content-rich spatial model of an ancient settlement. This work involves extensive research varying from literature study, field work and a close cooperation with the excavators. The student team will be closely supervised by Wendrich and Dieleman.

In year two, the copy editor and the copy editor for Arabic translations will be hired. The project will see increased activity because many articles will have passed the review process. The copy editor, G. Dubois, will report to Wendrich and will be in contact with the workflow manager and with authors in the latest phase of the production sequence (see Appendix D). She will make a final check of contributions for consistency in approach and spelling. As many of the contributors will be non-native English speakers, this will be a large responsibility. The copy editor for Arabic, M. Kamel, is an Egyptologist and Arabic native speaker. He will be hired for three months to copyedit the abstracts in Arabic translation for terminology and consistency. In years one and two, a postdoctoral scholar, specialized in Egyptian art, will be hired for three summer months. This person will work closely with the Wendrich in supervising the editorial assistants during the period when much of the work will be done. The postdoctoral fellow will work with the authors and museum staff to obtain and prepare images and other materials for linking to the text entries and will concentrate on the mark-up of the image database.

Due to a considerable level of interface development and software adaptation that will be required for the implementation of the UEE Full Version, UCLA is cost sharing the efforts of several staff from the Center for Digital Humanities (CDH) and from the University Library

beginning January 2005 (pilot phase) and continuing through the grant period. Dr. Zoe Borovsky, Academic Services Manager, CDH, supervises the work of her staff members and trains the editorial assistants. She will serve as project manager for the technical committee and as the liaison between the editorial and technical committees. Her staff—a team of seven full-time designers and programmers—will begin work on integrating CDH web-interfaces with the library's Oracle database in January 2006. By the time NEH funding is scheduled to begin, CDH will have implemented and tested a beta implementation using this technology, i.e., a CDH-designed website that connects to the library's storage system. Eugene Horikawa, Project Technical Coordinator, CDH**,** will be mainly responsible for designing and building the web interfaces, metadata schema, abstraction layer, and object catalog, assisted by CDH's database programmer Matthew Bazar. Shawn Higgins, Media Specialist, CDH, will design and create the web interfaces and multi-media content. Dr. Howard Batchelor, Digital Library Coordinator, UCLA Library, will be the liaison between the library programmers Curtis Fornadley and Henry Chiong and CDH. He will consult with CDH on designing the metadata schema and the abstraction layer that connects to the library's storage system.

4.6 Dissemination: the Audience

The UCLA *Encyclopedia of Egyptology* Open Version is online, and the first articles will be published in 2005. Each entry will be published as soon as it has passed the review and copy-editing process, and has received the final approval of the responsible editor. The UEE Full Version will be launched on the Web on June 1, 2008.

The audience of the UEE is diverse and broad, national and international, and consists of professionals and students of several disciplines as well as the general public. Worldwide 1350 professional Egyptologists are registered as members of the International Association of Egyptologists; 120 are active in the USA in teaching and museum positions. Egyptology is popular in the United States both inside and outside the academic world. Several museum collections of Egyptian artefacts are of worldwide importance (The Brooklyn Museum of Art and the Metropolitan Museum of Art in New York, the Walters Art Museum in Baltimore, the Museum of Fine Arts in Boston, the University of Pennsylvania Museum of Archaeology and Anthropology, the Oriental Institute Museum in Chicago, the Kelsey Museum in Ann Arbor, the Hearst Museum in Berkeley, the Virginia Museum of Fine Arts in Richmond, and the Michael C. Carlos Museum in Atlanta). Graduate courses in Egyptology and the Archaeology of Egypt are offered at Brown University, The Johns Hopkins University, University of Memphis, University of Michigan, New York University, Pennsylvania State University, Yale University, University of Chicago, University of Pennsylvania, University of California Berkeley, and University of California Los Angeles, while undergraduate courses are offered at many universities and colleges around the country. The annual meetings of the American Research Center in Egypt draw close to a thousand participants.

Students working with the museum collections and studying in these programs often have difficulty accessing secondary sources in Egyptology, many of which are written in German, French, or Italian. A good example is the standard reference work, the *Lexikon der Ägyptologie.* Graduate students in Egyptology are expected to read French and German, but undergraduate students are not. The UEE, with its well illustrated entries in English, will be an important tool in undergraduate teaching, not only for programs that regularly offer courses in Egyptology, but also for other humanities and social science disciplines such as history, art-history and architecture.

Apart from serving the academic world, the UEE will fulfill an important role in providing high quality information for the public. The interest of the general audience is apparent from the popularity of magazines such as *National Geographic*, *Archaeology*, and *KMT*. Movies feature Egyptian themes (From *Antony and Cleopatra* to *The Mummy* and *The Mummy Returns*). Exhibitions on ancient Egypt are immensely popular: from 1977 to 1979 objects from the tomb of

Tutankhamun, normally exhibited only in Cairo, toured the US and drew enormous crowds. In 2000 the *Pharaohs of the Sun* exhibition was equally successful. The popular exhibition *Eternal Egypt* showed items from the British Museum collection. In 2005 Tutankhamun returned to the US in the commercially produced exhibit "Tutankhamun and the Golden Age of the Pharaohs" and this has caused a surge in interest in ancient Egypt. Lectures given by Dr. Zahi Hawass in California in 2004 and 2005 attracted over 700 persons per lecture. Public interest is, furthermore, reflected in the large number of television programs featuring ancient Egypt on Discovery Channel, History Channel and PBS. Over 2000 books on ancient Egypt are offered through Amazon.com and popular books on Egypt sell well. Lastly, many websites deal with ancient Egypt.

In short, we believe that the UEE will serve as an important resource, that will bridge the gap between specialist and non-specialists who want access, in English (and to the extent we can provide, Arabic), to excellent materials from accredited sources.

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